



Fatal *Naegleria fowleri* infection acquired in Minnesota: Possible expanded range of a deadly thermophilic organism

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Abstract:

BACKGROUND: Primary amebic meningoencephalitis (PAM), caused by the free-living ameba *Naegleria fowleri*, has historically been associated with warm freshwater exposures at lower latitudes of the United States. In August 2010, a Minnesota resident, aged 7 years, died of rapidly progressive meningoencephalitis after local freshwater exposures, with no history of travel outside the state. PAM was suspected on the basis of amebae observed in cerebrospinal fluid. **METHODS:** Water and sediment samples were collected at locations where the patient swam during the 2 weeks preceding illness onset. Patient and environmental samples were tested for *N. fowleri* with use of culture and real-time polymerase chain reaction (PCR); isolates were genotyped. Historic local ambient temperature data were obtained. **RESULTS:** *N. fowleri* isolated from a specimen of the patient's brain and from water and sediment samples was confirmed using PCR as *N. fowleri* genotype 3. Surface water temperatures at the times of collection of the positive environmental samples ranged from 22.1 degrees C to 24.5 degrees C. August 2010 average air temperature near the exposure site was 25 degrees C, 3.6 degrees C above normal and the third warmest for August in the Minneapolis area since 1891. **CONCLUSIONS:** This first reported case of PAM acquired in Minnesota occurred 550 miles north of the previously reported northernmost case in the Americas. Clinicians should be aware that *N. fowleri*-associated PAM can occur in areas at much higher latitude than previously described. Local weather patterns and long-term climate change could impact the frequency of PAM.

Source: <http://dx.doi.org/10.1093/cid/cir961>

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Pathogen

Geographic Feature:

resource focuses on specific type of geography

Climate Change and Human Health Literature Portal

Freshwater

Geographic Location: 

resource focuses on specific location

United States

Health Impact: 

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease (other): Primary amebic meningoencephalitis (PAM)

Resource Type: 

format or standard characteristic of resource

Research Article

Timescale: 

time period studied

Time Scale Unspecified